

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : 10/577,542 Confirmation No. 9844
Applicants : Anthony
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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Rule 1.132 Declaration

I, Edward John Anthony, of 256 Second Ave, Ottawa, Ontario, Canada, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon, declares the following:

1. I am one of the inventors named in US Patent Application No. 10/577,542, filed on April 28, 2006 as a national stage entry in the United States from International Application PCT/CA03/01759 having international filing date November 14, 2003, to protect an invention entitled Reactivation of Lime Based Sorbents by CO₂ Shocking.

2 I hold a B.A. degree in Mathematics (Open University), a B.Sc. Single Honors in Chemistry and a PhD in Flame Chemistry (University of Wales). I am a Fellow of the Institution of Chemical Engineers (UK), and a Chartered Engineer under their statutes, a Fellow of the Institute of Energy and a Chartered Environmentalist under their statutes, and a Fellow of the Royal Society of Chemistry, and a Chartered Chemist and a Chartered Scientist under their statutes. I am currently an adjunct Professor with the Chemical Engineering Department at the University of Ottawa, and a guest Professor with Southeast University in Nanjing, China.

3. Currently, I hold a position as a senior research scientist with Natural Resources Canada, where I head the Gasification and Fluidized Bed Combustion Group. The broad general focus of my work currently includes thermal energy processes that can offer pure CO₂ streams for sequestration, and gasification technology, both in its high-pressure and atmospheric forms. I am the author of 128 journal papers on various aspects of combustion and gasification, along with 144 conference papers, 7 book chapters, and I am the co-editor of the first book on Pressurized Fluidized Beds. More particularly, my current R&D pursuits are strongly focused on calcium looping cycles, oxy-fired CFBC technology and pressurized, entrained-flow gasification.

4. This invention involves the use of concentrated carbon dioxide to shock a lime based sorbent, and thereby enhance its effectiveness in a carbon dioxide capture process.

5. In the technical context of industrial applications, the meaning of an otherwise apparently relative term such as "concentrated" will primarily depend on the field of application in which it is being used.

6. In relation to any chemical component in a mixture or similar environment, the meaning of "concentrated" will depend on whether the component is being used as a direct reagent, in which case "concentrated" will represent a measure of sufficiency to effect the desired reaction, or as an excluder of other substances, in which case "concentrated" will represent a measure of sufficiency, primarily volumetric, in the physical circumstances to exclude those substances, and will in the case of gaseous mixtures mean close to 100%.

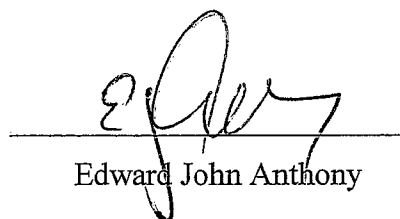
7. In the field of application of the present invention, as identified and discussed in the specification, a "concentrated" stream of carbon dioxide is provided to the sorbent. The person skilled in this art would clearly understand this to mean a high level of concentration, in this case of at least 85%, in order to provide the "shock" to the sorbent.

8. This understanding is consistent with the meaning of "concentrated" as used in identifying volumetric percentage values for carbon dioxide in related fields. For example, US Patent 4,344,486 identifies "concentrated carbon dioxide" as an effective agent in an enhanced oil recovery method as being at least 90%. Further, in the field of carbon capture and storage, it is well known that the stream of carbon dioxide is required to be at least 90% pure for safety and effectiveness.

DECLARED at Ottawa in the]
Province of Ontario, Canada]
this 9th day of July 2009]
before me,]



Heather Probert, Notary Public



Edward John Anthony